



# UNIVERSITÀ DEGLI STUDI DI TORINO

## I@UNITO – Visiting Scientists

Scientific area	Scientific responsible	Host Department	Type of activity	Start of mobility	Language
Analytical chemistry & chemometrics applied to large forensic and clinical datasets	Prof. Marco Vincenti	Department of Chemistry	Computational, in the field of chemometrics & multivariate statistics on large analytical datasets.	Any time in 2017	English
Type of fellowship	Junior (less than 40 years old) 3 months fellowship				
Title of the research project	Development and evaluation of (multiclass) likelihood ratio models supported by chemometric tools for large analytical datasets interpretation in medical diagnosis and forensic casework				
Description of the research project	<p>The project is aimed at investigation of multivariate physicochemical patterns for classification purposes by application of Likelihood Ratio (LR) approach. Essentially, the project is to oscillate between the need of ensuring proper hybrid model construction (need of dimensionality reduction, feature selection by chemometric tools (e.g. PLS-DA, SIMCA) before data interpretation by suitable LR test) and warranting its validity. The latter is to be facilitated by validation schemes including Empirical Cross Entropy and suitable sampling strategies. The project might encompass variety of analytical data (e.g. steroidomic profiles) arising from the combination of chromatographic and mass spectrometric techniques (GC-MS, UHPLC-MS/MS) and stemming from forensic (alcohol or drug abuse) or medical (chronic and non-chronic discrimination; screening of oncological pathologies) contexts.</p>				
Profile Description	<p>The ideal candidate is a young researcher at PhD or Post-Doc level, who has been formed in the areas of analytical and forensic chemistry and already possesses strong competence in the field of large analytical data interpretation by means of multivariate statistics and chemometric tools. More specific preference conditions include the knowledge and application experience of Bayesian statistics tools (i.e., Likelihood Ratio) and Bayesian-hybrid modeling.</p>				
Research objectives	<p>The main research objective is to develop appropriate classification models that are supported by a quantitative or semi-quantitative reliability scales, even in multiclass (&gt;2) contexts. The concept of the likelihood ratio has been progressively introduced in the courtrooms to sustain a scientific evidence within a guilt/innocence alternative. In the present research, the main purpose is to develop analogous evidence interpretation tools within three-classes alternatives, such as for example drug addiction/occasional intake/abstinence and oncological pathology/pre-pathological conditions/healthy conditions.</p>				
Website and Contact	<p>Marco Vincenti - Phone: +39.011.670.5264 - Mobile: +39.347.4198.878            E-mail: marco.vincenti@unito.it            Web: <a href="http://scholar.google.it/citations?user=psAo9C8AAAAJ&amp;hl=it">http://scholar.google.it/citations?user=psAo9C8AAAAJ&amp;hl=it</a></p>				